

Increasing Efforts to Reduce Cervical Cancer Through State-Level Comprehensive Cancer Control Planning

Running title: Opportunities for cervical cancer in state cancer plans

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Abstract

Reducing cervical cancer disparities in the U.S. requires intentional focus on structural barriers such as systems and policy which impact access to human papillomavirus (HPV) vaccination, cervical cancer screening and treatment. Such changes are difficult and often politicized. State comprehensive cancer control (CCC) plans are vehicles that, if designed well, can help build collective focus on structural changes.

Study objectives were to identify the prioritization of cervical cancer in state CCC plans, the conceptualization of HPV within these plans, and the focus of plans on structural changes to reduce cervical cancer disparities. Data were gathered by systematic content analysis of CCC plans from 50 states and the District of Columbia from February-June 2014 for evidence of cervical cancer prioritization, conceptualization of HPV, and focus on structural barriers to cervical cancer vaccination, screening or treatment.

Findings indicate that prioritization of cervical cancer within state CCC plans may not be a strong indicator of state efforts to reduce screening and treatment disparities. While a majority of plans reflected scientific evidence that HPV causes cervical and other cancers, they did not focus on structural elements impacting access to evidence-based interventions.

Opportunities exist to improve state CCC plans by increasing their focus on structural interventions that impact cervical cancer prevention, detection, and treatment; particularly for the 41% of plans ending in 2015 and the 31% ending between 2016-2020. Future studies should focus on the use of policy tools in state CCC plans and their application to cervical cancer prevention and treatment.

Introduction

Cervical cancer remains among the top ten diagnosed cancers for African American and Hispanic women in the United States, despite dramatic declines in cervical cancer morbidity and mortality since the mid 20th century.(1) Incidence rates among these minority populations(2-8) and those who are uninsured(1,9-11) have remained relatively stable for the past several years,(12-13) suggesting that system characteristics are likely preventing population health improvement.

Addressing systems problems and changing policies are examples of public health structural interventions because they alter the structural context for health. Such interventions are not often favored because they involve addressing sociopolitical arrangements in the policy process. Examples of structural interventions to reduce U.S. rates of cervical cancer include, but are not limited to, Medicaid expansion and other health financing adjustments to maximize vaccination, screening and treatment access; strengthened human papillomavirus (HPV) vaccination requirements for adolescents; and the identification and establishment of alternative HPV vaccination venues such as pharmacies and schools.(14) State efforts to enact such structural interventions often meet with high levels of politicization as well as resistance to policy implementation. Despite such challenges, policy-based structural interventions are often required, because public health is centrally about addressing the *conditions* that affect the health of populations.(15)

There have been efforts to assist community development of structural interventions. In 2010, the Centers for Disease Control and Prevention (CDC) provided 2-year funding to 50 communities across the U.S. to develop policy, systems and environmental interventions

(“PSE”) to reduce obesity, tobacco use and second hand smoke exposure.(16) Thirty-two states received funding for area (urban/rural) and topic specific (obesity/tobacco) community action planning. That same year, CDC provided 5-year funding to 13 states to demonstrate the capacity of comprehensive cancer control programs to implement policy and environmental cancer control interventions. The intent of the funding was to develop capacity to prioritize and track state and local cancer control policy changes.(17)

An important vehicle for communicating structural change is the state-level comprehensive cancer control (CCC) plan. Well-designed CCC plans can facilitate structural efforts because they have the potential to broaden the base of support for change through strategic direction for advocacy, funding, and system change. State CCC plans are an example of what has been called ‘small p’ policy expressions,(18) because while not developed by elected officials, these plans are established and supported by state agencies and partners with the potential for broad population-level impact.

CCC plans are the result of a long-standing funding partnership between the Centers for Disease Control and Prevention (CDC) and states, territories and tribal organizations to coordinate and align the many cancer efforts toward common goals, objectives and strategies. Initiated in 1998 among five states, CCC planning is now conducted in all 50 states and the District of Columbia, seven tribal nations and in seven U.S. territories and Pacific Island jurisdictions.(19-21) Evaluations of these plans have focused on their accomplishments,(22-23) strength of the plan elements themselves (plan organization, use of evidence, clearly stated objectives, and mapping of funding to objectives),(17,24) and specific focus area such as genomics content, colorectal screening and HPV vaccination.(18,25-27)

Dramatically reducing or even eliminating U.S. cervical cancer disparities is within our grasp with extant public health tools of vaccination, screening and early treatment. Therefore, we present here results from a systematic review of state CCC plans in all 50 states and the District of Columbia to see whether these cervical cancer prevention tools are emphasized, and whether structural interventions are among the stated strategies to address cervical cancer. Study objectives were to identify the prioritization of cervical cancer in state comprehensive cancer plans, understand the conceptualization of HPV in these plans, and to identify evidence of structural interventions focused on likely systems and policy barriers in the fight against cervical cancer.

Materials and Methods

A systematic content analysis of CCC plans for the 50 states and District of Columbia was conducted between February and June 2014. Plans were accessed from the National Comprehensive Cancer Control Program of the CDC.(28) Jurisdictions with out-of-date plans were contacted by email to submit a more current plan by May 30, 2014.

A content analysis instrument was developed to gather text evidence of plan content focused on cervical cancer, cancer plan characteristics, and state characteristics. Indicators of plan and state characteristics were gathered to contextualize the analysis and allow for comparison between states. We abstracted data on cervical cancer plan content using the following measures: cervical cancer prioritization (whether cervical cancer was listed among the top 5 or top 10 cancer priorities); conceptualization of HPV (whether plan language articulated a

relationship between HPV and cervical cancer and/or other cancers); and evidence of structural interventions to address cervical cancer. Cancer plan characteristics included the age of the plan (current, out of date), time period (years covered), cycle (newly initiated, mid, end), and endorsement (governor, legislative, state agency). Planning cycle was defined as follows: “newly initiated” referred to those plans beginning no earlier than 2013, “mid-cycle” referred to plans ending in the years between 2016-2020, and “end” referred to plans ending their cycle in 2015. State characteristics of interest included state population size, region (census region and division),(29) and cervical cancer incidence and mortality.(30) State health access indicators included the proportion of women ages 19-64 years who were uninsured in 2013;(31) proportion of women without a health care provider or personal doctor in 2010-2012;(32) and HPV vaccine completion rates of ≥ 2 doses for girls and for boys in 2013.(33) Health related access policies of interest included whether state had expanded Medicaid (or has plans to expand);(34) whether the state had expanded access for family planning services under a state Medicaid plan waiver (which expands cervical cancer screening and follow-up);(35) and whether the state had religious or religious plus philosophical exemptions from school immunization requirements in 2012.(36) State funding indicators of interest included state, CDC and HRSA per capita public health investments;(37) whether the state had a grant from CDC for policy and environmental programs interventions;(38) whether the state had community that was funded by CDC under the Communities Putting Prevention to Work to focus on PSE strategies for tobacco, obesity or both;(16) per capita CDC cancer prevention and control funding;(39) per capita funding to increase HPV vaccination coverage rates among adolescents;(40) and the state vaccine funding regime in 2011.(41) Vaccine funding regime refers to state financing and supply policy for childhood vaccination (up to 18 years of age) for private providers. State funding regimes are commonly classified into 5 categories: “universal purchase,” meaning that the state supplies all routinely recommended childhood vaccines to all

participating private providers regardless of insurance status; “universal purchase select,” meaning that the state supplies many but not all of the recommended vaccines regardless of insurance status with the remainder provided only for Vaccine For Children (VFC) eligible children; “VFC and underinsured,” meaning that the state supplies all recommended vaccines for VFC-eligible and underinsured children; “VFC and underinsured-select,” meaning that the state supplies many, but not all recommended vaccines for VFC and underinsured children with the remaining available only to VFC-eligible children; and “VFC only,” meaning that the state supplies recommended vaccines only for VFC-eligible children. See Table 1.

Two independent investigators developed a codebook based on research objectives. A coding conference was held after the first 12 CCC plans were reviewed to assess reliability, confirm clarity and to identify and manage coding discrepancies. All CCC plans were reviewed with a revised and improved data-gathering instrument.

Most measures were straightforward, with the exception of HPV conceptualization and evidence of structural intervention strategies for cervical cancer. Qualitative statements in the CCC plan about HPV were coded as having no reference to cervical cancer, reference as a cause of cervical cancer; and reference as a cause of cervical and other cancers. Dummy variables were created to test bivariate associations between state, plan and cervical cancer plan content characteristics. CCC plan cervical cancer-related goals, objectives and strategies were coded as having structural focus using an *a priori* framework based on the work of Blankenship and colleagues,(42) if focused upon the structural causes of disease or risk for cervical cancer. These include: community mobilization focused on altering the balance of power to advance other changes, institutional delivery system improvements, funding policies,

economic interventions and policy change. Strategies had to be well-articulated to be coded as structural. So, for example, a plan that stated a need to expand funding for free screening but did not fully articulate strategies to do so were not coded as having a structural intervention.

Associations between CCC plan content related to cervical cancer, plan characteristics, and state characteristics (including health access and funding) were tested using ANOVA and χ^2 testing with Fisher's Exact Test as appropriate. Significance of observations were noted when significant at $p < .05$ level.

Results

CCC plans from 50 states and the District of Columbia were reviewed for the study. The majority of CCC plans were 4-year (41.2%) and 5-year (43.1%) in scope, with a range from 1-10 years. Most plans (80.4%) were current. In terms of planning cycle, 7.8% were "newly initiated;" or beginning no earlier than 2013, 41.2% of plans were nearing the end of their cycle in 2015, and 31.4% of plans were classified as "mid-cycle," or ending in the years between 2016-2020. Pacific division states tended to have out-of-date plans (AK, OR, WA: $p < .05$); states from the West North Central division tended to be in mid planning cycle (IA, KS, MN, NE, ND: $p < .05$) and East North Central division states tended to have plans ending in 2015 (IL, IN, MI, OH, WI: $p < .01$). See Table 2.

Prioritization of Cervical Cancer

Discerning the prioritization of cervical cancer in the CCC plans was a bit difficult, as 45.1% of plans contained priorities that were not clearly ordered. However, 21.6% of plans identified

cervical cancer among the top 5 priorities, 13.7% listed cervical cancer as 6th-10th in priority, and 19.6% of plans did not list cervical cancer among the CCC plan priorities. See Figure 1.

Plans identifying cervical cancer among the top 5 priorities were most likely initiated since 2013 ($p=.03$), had been from states with higher rates of cervical cancer among Hispanic women in 2009 [$F(1,15)=7.2$, $p=.02$], and had been developed by states having a philosophical exemption for vaccination in 2012 ($p=.03$). See Table 3.

All plans but one addressed cervical cancer; though not all plans mentioned HPV, the proven cause of virtually all cervical cancers. Six plans (11.8%) did not mention HPV at all (PA, NV, MT, IL, ID, HI). This may be a function of timing with dissemination and adoption of scientific evidence, as all but the Pennsylvania plan were ending by 2016. This notwithstanding, statistical significance between plan phase and absence of HPV was not observed.

Of the 45 CCC plans discussing HPV, the majority (57.8%) conceptualized HPV only in terms of cervical cancer. Almost half (42.4%) of plans conceptualized HPV as being linked with many cancers. CCC plans conceptualizing HPV in terms of its relationship to many cancers tended to have more recent implementation dates of 2013 and later. Further, plans articulating a relationship between HPV and cervical cancer tended to list cervical cancer among the top 5 priorities. Notably, plans that articulated HPV's relationship to many cancers did not prioritize cervical cancer at all. See Table 4.

Approach to Cervical Cancer

The vast majority (80.4%) of state CCC plans were educational in orientation, with the focus at the individual behavior change level. Examples include increasing screening or vaccination uptake by individuals or communities through public education about screening availability and about HPV vaccination. Clinician behavior change was the primary focus for 41.2% of the state plans. Here, the targeted behavior was to increase screening or vaccination provision through guidelines education. Only 6 (11.7%) plans identified policies or policy change for collective attention (AK, CT, DE, MI, NV, NJ). Policies described included third party coverage for Pap and HPV testing, requirements for targeted parental education about HPV vaccine for 6th grade girls (specifically), increased funding (general and VFC coverage) to purchase HPV vaccine for girls and boys, and Medicaid expansion. In each of these cases, however, listed strategies included only mild references to advocacy or coalition building without any additional strategic direction about how these changes were going to be attempted or supported. Notably, only 2 of the 6 states were recipients of the 2010 policy and environmental funding initiatives. Michigan received the 5-year policy tracking capacity funding, and Nevada received the 2-year community-level structural intervention planning funding. In these two cases, it is unclear whether state plans reflected policy learning from the funding initiatives, because while Michigan's plan was from 2009-2015, it was revised in 2012. Nevada's plan was from 2011-2015, with no evidence of revision during the time period.

Discussion

Several observations emerge from this systematic review of state CCC plans. First, it appears that scientific discoveries about the connection between HPV and cancers are being heard and encoded in state plans. This reference primarily occurs in discussion sections or epidemiologic profiles within the plans. The translation of this evidence into implementable plans to increase

HPV vaccination and screening with HPV diagnostic tests, however, is not fully clear. Some state CCC plans recognized the connection between HPV and cancers but did not articulate strategies to increase vaccination or screening.

Second, the planning around cervical cancer remains focused largely at the individual level: change the individual behavior of patients and providers. While some plans noted the structural barriers of insurance, unsupportive vaccine policy environments or underfunded systems of screening and follow-up, there was a paucity of strategies addressing these issues. The lack of structurally focused state CCC plans and articulated evidence-based structural interventions to address cervical cancer is of great concern and warrants future studies of the potential for utilization of policy tools in plans to help facilitate future adoption of policy and structurally related planning.

Third, it was surprising to note the lack of association between various state policy characteristics and plan content. We assumed there to be associations with structural indicators such as public health funding, existing vaccine policy and screening expansion policies (such as Medicaid expansion or waiver); though, it was not necessarily clear what direction those associations might have. Future structural level studies should continue to refine the selection of these indicators, as there may in fact be a link or association that we do not yet see. Notably, we did not observe associations between receipt of policy development funding and structural interventions or advocacy planning. This may be an issue of timing, as both funding mechanisms were initiated in 2010. Perhaps time and policy learning will result in the observation of planned structural or systems level changes and advocacy for them.

Finally, it is possible that prioritization of cervical cancer does not represent a reliable marker of whether cervical cancer is actually prioritized, because almost half of plans (45.1%) did not prioritize specific cancers. That a state plan prioritizes cervical cancer does not mean strategies will be evidence-based or structural in nature. Further, plans that did not explicitly prioritize cervical cancer often contained strategies addressing it.

It is important to recognize that while state CCC plans shared several characteristics, state plans varied considerably. Even as the federal government finances the state CCC planning effort, there is room for state flexibility to develop plans that are reflective of the greatest cancer burdens in these jurisdictions, and can be advanced by statewide partners. Advising states about the structural change opportunities presented by CCC planning would be a wise endeavor as evidence begins to emerge.

Several opportunities exist to encourage the inclusion of strategies focused on structural or policy issues in CCC plans. Almost half of the plans (41.2%) are nearing the end of their planning cycle in 2015 and can take time to focus on how they are addressing cervical cancer and HPV in their plans. Understanding perceptions of planners about actual and perceived barriers to HPV specific planning as well as barriers to structurally based planning generally would allow for greater interpretation of these observations.

As we move away from disease specificity in our policy and planning to focus more on structural aspects which impact populations across cancers, we may find that it is easier to focus on structural interventions and related preparations for them such as coalition building

across cancer specific coalitions. This would help states and their cancer control partners tap into a broader base of supporters for the difficult and necessary changes required to significantly reduce cancer-related health inequities.

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Table 1: State Comprehensive Cancer Control Plan Study Variables

| Selected Comprehensive Cancer Control Plan Content | |
|---|---|
| Plan priorities | Ranking of cervical Cancer (among the top 5 priorities, among 6-10 th priorities) |
| Conceptualization of Human papillomavirus | <ul style="list-style-type: none"> • Mention of HPV in plan • HPV's relationship to cervical and other cancers |
| Evidence of structural interventions | <ul style="list-style-type: none"> • Strategies focused on financing, systems or policy • Primary emphasis of strategies (if not structural) |
| Comprehensive Cancer Control Plan Characteristics | |
| Age of plan | <ul style="list-style-type: none"> • Current/out of date • Plan cycle (beginning, mid, end) |
| Plan endorsement | Governor, legislature, state health agency |
| State Characteristics | |
| | <ul style="list-style-type: none"> • State population 2013 • US census region, division • % women ages 19-64 who were uninsured in 2013 • % women without a health care provider or personal doctor, 2010-2012 • Cervical Cancer morbidity and mortality rates by race/ethnicity, 2009 • % HPV vaccination coverage of ≥ 2 doses for boys • % HPV vaccination coverage of ≥ 2 doses for girls |
| Access policies: | <ul style="list-style-type: none"> • Expanding Medicaid? (Yes/No) • Medicaid waiver to expand family planning services? (Yes/No) • Philosophical exemption for vaccination (Yes/No) • Religious exemption for vaccination (Yes/No) |
| Funding | <ul style="list-style-type: none"> • State per capita public health investment (2010-2011, 2011-2012, 2012-2013) • CDC and HRSA per capita funding to the state (2013) • Policy and environmental program interventions funding, 2010 (5-year) (Yes/No) • Communities putting prevention to work with PSE for tobacco and/or obesity, 2010 (2-year) (Yes/No) • Per capita CDC Cancer prevention and control funding (2013) • Per capita funding to increase HPV vaccination among adolescents (2013) • State vaccine funding regime (Universal, Universal-select, VFC and underinsured, VFC and underinsured-select, VFC only) |
| US= United States; CDC=Centers for Disease Control and Prevention; HRSA=Health Resources and Services Administration; VFC= Vaccine for Children | |

Table 2: Overview of Comprehensive Cancer Plan Characteristics in 50 States and the District of Columbia

| | N(%) |
|-------------------------|----------|
| Plan Cycles | |
| Out of date | 10(19.6) |
| Initiated since 2013 | 4(7.8) |
| Middle of cycle | 16(31.4) |
| Ending by December 2015 | 21(41.2) |
| Endorsement | |
| None | 25(49) |
| State agency | 17(33.3) |
| Governor | 9(17.6) |
| Legislative | 2(3.9) |
| Scope of Plan | |
| 5-year | 22(43.1) |
| 4-year | 21(41.2) |
| 3-year | 4(7.8) |
| 1-year | 2(3.9) |
| 8 or 10-year | 2(3.9) |

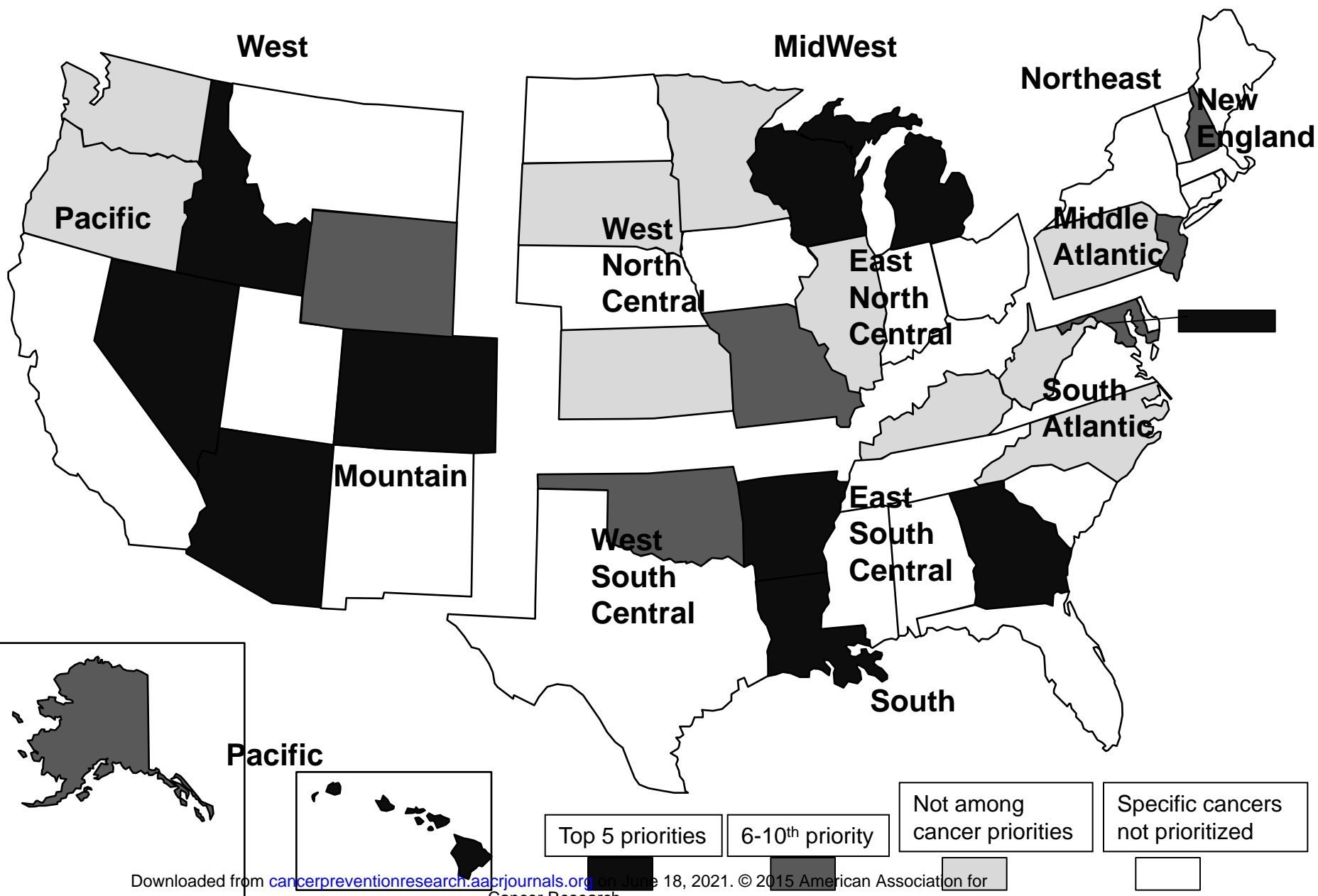
Table 3: Prioritization of Cervical Cancer in Comprehensive Cancer Control Plans in 50 States and the District of Columbia

| | Morbidity and Mortality Higher Rates of Cervical Cancer among Hispanic Women, 2009 | Higher HPV vaccine coverage of \geq 2 doses, 2013 | Plan Cycle or scope | Vaccine Policies |
|-------------------------|---|---|--|--|
| Unclear | F=4.8* | | | |
| Not prioritized | | For boys F=5.5* | Plans of 8 or 10 year span, $X^2=8.5^*$ | |
| Top 5 Cancers | F=7.2* | | Initiated since 2013 $X^2=7.3^*$ | Philosophical Exemption $X^2=4.9^*$ |
| Top 6-10 Cancers | F=7.0 (p=.06) | | | |
| *p<.05 **p<.01 | | | | |

Table 4: HPV Conceptualization and State Characteristics Among Jurisdictions identifying HPV in the Comprehensive Cancer Plan (N=45)

| | Cervical Cancer Prioritization | Higher rates of Cervical Cancer Incidence, 2009 | Larger State population | U.S. Region | Plan start date ≥ 2013 | Vaccine For Children Coverage: Universal |
|-----------------------------------|--|---|-------------------------|---|-----------------------------|--|
| HPV Causes Cervical Cancer | Top 5 $\chi^2=6.0^*$ | | $F=4.7^*$ | Midwest $\chi^2=6.6^{**}$ West North Central $\chi^2=7.8^{**}$ | $\chi^2=6.0^*$ | $\chi^2=6.5^{**}$ |
| HPV Causes many Cancers | Top 5 $\chi^2=4.3^*$ Not prioritized $\chi^2=4.0^*$ | White Women $F=3.8$, $p=.056$ | $F=4.8^*$ | South Atlantic $\chi^2=7.7^{**}$ | $\chi^2=6.0^*$ | $\chi^2=4.0^*$ |
| * $P<.05$ ** $P<.01$ | | | | | | |

Figure 1: Prioritization of Cervical Cancer in Comprehensive Cancer Plans by Census Regions and Divisions (N=51)



Cancer Prevention Research

Increasing Efforts to Reduce Cervical Cancer Through State-Level Comprehensive Cancer Control Planning

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